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भारतीय मानक
संवेदनाहरण विज्ञान - शब्दावली

Indian Standard
ANAESTHESIOLOGY — VOCABULARY

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BUREAU OF INDIAN STANDARDS
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Page 4

Clause 2.1 : Delete the existing text and substitute the following:

"**2.1 breathing** system . Those gas pathways continuously or intermittently in communication with the patient's respiratory tract during any form of ventilation.

NOTES

1 In practice, a breathing system usually extends from

a) the point of supply[1] of a controlled gas mixture, for example, the common gas outlet of an anaesthetic machine, or

b) the fresh-gas inlet of a circle system, lung ventilator, T-piece, etc, or

c) the fresh-gas inlet of a manually-operated resuscitator

2 It usually extends to the point at which gas mixture escapes to atmosphere or a gas scavenging system, for example from an APL valve, the open end of a T-piece, etc

3 Gas pathways exclusively concerned with gas scavenging systems are not regarded as part of a breathing system

4 It is not possible to eliminate all ambiguity in defining the term 'breathing system' When this term is used in any standard or document, or other scientific publication, in which it could affect the precise interpretation thereof, the limits and configuration of any 'breathing system' referred to therein should be clearly defined "

Page 7

Clause 5.3.5 : Delete the existing text and substitute the following:

"5.3.5 **patient system** : Those parts of a breathing system contained within a ventilatdr. It a ventilator has a non-integral inspiratory/expiratory valve(s), the tubing connecting this/these to the ventilator is regarded as part of the patient system."

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[1] In some situations, particularly in lung ventilators, this point may be inside a piece of equipment and should not be confused with a connection port fitted elsewhere, for example, on the casing of a ventilator "

Indian Standard

ANAESTHESIOLOGY — VOCABULARY

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 4135 : 1979 'Anaesthesiology — Vocabulary' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Anaesthetic, Resuscitation and Allied Equipment Sectional Committee (MHD 13) and approval of the Medical Equipment and Hospital Planning Division Council.

The text of the ISO standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following :

a) Wherever the words ' International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards the current practice is to use a point (.) as the decimal marker.

Only the English language text in the International Standard has been retained while adopting it in this Indian Standard.

An amendment 1 to ISO 4135 : 1979 has also been issued, which is reproduced at the end of the text of the standard.

Scope and field of application

This International Standard establishes a vocabulary of terms used in connection with anaesthesiology and medical ventilation

1 Analgesia and anaesthesia

1.1 analgesia Reversible elimination of the sensation of pain

1.2 analgesia, local[1] The reversible (unless neurolysis is sought) loss of the sensation of pain in a localized part of the body, deliberately produced

1.3 analgesia by acupuncture Analgesia induced and/or maintained by insertion of needles into selected points of the body

1.4 anaesthesia Reversible elimination of all sensation

1.5 analgesia/anaesthesia, general Reversible loss of consciousness and all sensation, deliberately produced for therapeutic purposes, in which the reflex responses to stimuli are diminished or eliminated It is usually controlled by the administration of drugs

1.5.1 analgesia/anaesthesia, intravenous
Analgesia/anaesthesia induced and/or maintained by the intravenous administration of one or more drugs

1.5.2 analgesia/anaesthesia, inhalation
Analgesia/anaesthesia induced and/or maintained by pulmonary ventilation with anaesthetic vapours and/or gases

1.5.3 analgesia/anaesthesia, insufflation Technique of inhalation analgesia/anaesthesia in which a continuous flow of the anaesthesic mixture is delivered directly into the upper respiratory tract

1.5.4 analgesia/anaesthesia, (endo)tracheal Technique of inhalation analgesia/anaesthesia induced and/or maintained by anaesthetic vapours and/or gases delivered within the trachea, by means of a tracheal or a tracheostomy tube

1.5.5 analgesia/anaesthesia, electrical
Analgesia/anaesthesia induced and/or maintained by the passage of electric currents through nervous tissue

1.5.6 analgesia/anaesthesia, hyperbaric
Analgesia/anaesthesia induced and/or maintained in a patient who is in an ambient pressure above atmospheric

1.6 anaesthesia, local[1] Loss of all sensation in a localized part of the body, deliberately produced

1.7 analgesia/anaesthesia, conduction Interruption or depression of nerve impulse conduction at the site of application.

1.7.1 analgesia/anaesthesia, surface [topical] Interruption or depression of nerve impulse generation or conduction produced by application of a suitable agent on a selected surface

1.7.2 analgesia/anaesthesia, infiltration Interruption or depression of nerve impulse conduction produced in a localized region by the deposition of a suitable agent at that site

1.7.3 analgesia/anaesthesia, regional field block Interruption or depression of nerve impulse conduction produced by deposition of a suitable agent blocking the nerve supply of a specific region

1.7.4 analgesia/anaesthesia, nerve block Interruption or depression of nerve impulse conduction produced by deposition of a suitable agent on or near a specific nerve

1.7.5 analgesia/anaesthesia, paravertebral Interruption or depression of nerve impulse conduction produced by the deposition of a suitable agent blocking the spinal nerve at or near the intervertebral foramina

1.7.6 analgesia/anaesthesia, plexus block Interruption or depression of nerve impulse conduction produced by deposition of a suitable agent at or near an anatomical nerve plexus.

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[1] The terms "local anaesthesia and "local analgesia have frequently been used synonymously, this interchange is to be deprecated and it is recommended that stricter attention be paid to the definition given

[1] The terms "local anaesthesia" and "local analgesia ' have frequently been used synonymously, this interchange is to be deprecated and it is recommended that stricter attention be paid to the definition given

1.7.7 analgesia/anaesthesia, epidural ("epidural" is to be preferred to "peridural") : Interruption or depression of nerve impulse conduction produced by deposition of a suitable agent within the epidural space.

It can be applied in the cervical, thoracic, lumbar, or sacral region.

1.7.8 analgesia/anaesthesia, subarachnoïd [spinal] : Interruption or depression of nerve impulse generation or conduction produced by deposition of a suitable agent within the subarachnoïd space.

1.7.9 analgesia/anaesthesia, caudal : Interruption or depression of nerve impulse conduction produced by deposition of a suitable agent within the sacral epidural canal.

1.7.10 cryo-analgesia/anaesthesia; refrigeration analgesia/anaesthesia : Technique of reversible analgesia/anaesthesia produced by local or regional cooling.

1.8 narcosis : Reversible state of central nervous system depression produced by a chemical or physical agent.

1.9 basal narcosis : Narcosis used prior to or during any procedure, sufficiently deep to require constant skilled supervision of the patient.

1.10 premedication : Administration of a drug or drugs in the preoperative period to reduce anxiety and to facilitate anaesthesia or analgesia and to minimize complications or side effects.

2 Breathing systems

Introduction

Anaesthetic breathing systems must be designed to allow control of the composition of the inspired mixture.

The exact arrangement of any system and the mode of use will determine the composition of the mixture and the amount of rebreathing.

2.1 breathing system : Gas pathways in direct connection with the patient through which intermittent or reciprocating gas flow occurs and into which a mixture of controlled composition may be dispensed.

2.2 enclosed medical gas system : Partially or completely enclosed volumes including the patient's respiratory tract, in which continuously or temporarily some quantities of flammable and/or explosive mixtures may be produced, guided or used. (See IEC Publication 601-1.)

2.3 breathing tube (anaesthesia breathing system) : Large-bore, non-rigid tube, usually corrugated, used to convey gases and/or vapours between the anaesthetic machine and/or some ventilators and the patient.

2.4 inhalation anaesthesia apparatus : Equipment intended for dispensing and delivering anaesthetic gases and vapours into a breathing system for delivery to the patient.

2.4.1 continuous flow apparatus : Device delivering a continuous flow of anaesthetic gases or vapours at the ambient pressure, to meet the patient's respiratory requirements.

2.4.2 demand (intermittent flow) apparatus : Device delivering a flow of gas, patient-triggered, during inspiration only at ambient pressure (or at respiratory pressure).

2.5 to-and-fro absorption system : Valveless breathing system in which the flow of gases through a carbon dioxide absorber placed between the reservoir bag and the patient connector port is bidirectional.

2.6 circle system : Breathing system in which the direction of gas flow, through separate inspiratory and expiratory pathways is determined by unidirectional valves.

2.6.1 circle absorption system : Circle system incorporating a carbon dioxide absorber.

2.7 rebreathing : Inhalation of previously respired mixture from which carbon dioxide may or may not have been removed.

2.8 apparatus dead space : That volume of expired gases, contained within the breathing system of the apparatus, which is reinspired without substantial change of carbon dioxide content. In practice this volume varies with the design of any particular apparatus and its mode of use.

2.9 Classification of breathing systems based on the amount of rebreathing that occurs

2.9.1 "non"-rebreathing system : System from which all the expired mixture is discharged.

2.9.2 partial rebreathing system[1] : System in which a portion of the expired mixture is retained within the system.

Carbon dioxide may be totally or partially eliminated.

2.9.3 "complete" rebreathing system; closed system : System from which no expired mixture is discharged. In anaesthetic practice, carbon dioxide is removed from the mixture within the system, completely, partially or not at all.

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[1] The terms "semi-open" and "semi-closed" are to be deprecated.

2.10 breathing attachments Components intended to make up or complete a breathing system

2.11 common gas outlet That port through which the dispensed mixture from the anaesthetic apparatus is delivered to the breathing system (See note in 2 4)

NOTE – The above definition is related to function In structural terms, any gas outlet port will be known by the component of which it is a port for example vaporizer outlet, machine outlet, cabinet outlet

2.12 patient connection port That opening at the patient end of an expiratory valve unit, a Y-piece fitting or a unidirectional valve to which may be connected either a tracheal tube adaptor or a face mask angle piece

2.13 adaptor bag, adaptor tube Component to one end of which the neck of a reservoir bag or corrugated tubing may be semi permanently attached The other end of the bag or tube adaptor will be the standard male or female cone as required

2.14 inspiratory port (of a circle absorption system) That opening through which gases and/or vapours pass during inspiration

2.15 expiratory port (of a circle absorption system) That opening through which gases and/or vapours pass during expiration

2.16 anaesthetic vaporizer Device designed to facilitate the change of an anaesthetic agent from a liquid to a vapour

2.17 draw-over vaporizer Vaporizer in the breathing system – or used by itself – from which the flow of a gas vapour mixture is produced by lowering the pressure at its outlet below that at its inlet by the patient's inspiratory effort or by a mechanical device Air or oxygen-enriched air is commonly used as the carrier gas

2.18 temperature compensated vaporizer Vaporizer which is designed to prevent fluctuations in delivered vapour concentration due to changes in temperature under normal conditions of use

2.19 premixed gases : Compressed gases which have been mixed in known proportions in the process of filling their cylinder.

2.20 manifold Collecting or distributing system with multiple entries and a common outlet or vice versa

3 Connectors and valves

3.1 connector Fitting to join together two or more components

3.1.1 adaptor . Specialized connector to establish functional continuity between otherwise disparate or incompatible components

3.1.2 sleeve Adaptor which alters the external diameter

3.1.3 mount (UK), **bushing** (US) Adaptor which alters the internal diameter

3.1.4 T- or Y-piece Tubular connection with three ports in the shape of the corresponding letter.

3.2 Valves

3.2.1 directional valve Valve designed to control the flow of a fluid[1] in a particular direction

3 2.2 unidirectional valve · Valve which allows the flow of a fluid in one direction only

3.2.3 inspiratory valve Valve which, when open, allows gas to pass through it to the patient only during the inspiratory phase

3.2.4 expiratory valve Valve which, when open, allows gas to pass through it from the patient only during the expiratory phase

3.2.5 inspiratory-expiratory valve . Single valve which performs the function of both an inspiratory and expiratory valve

3.2.6 pressure-limiting valve Device incorporated into a breathing system which limits the pressure within the system and which performs one or more of the following functions .

a) safety device,

b) control over peak intra-system pressure,

c) excess gas spillage.

3.2.7 safety valve/pressure-relief valve : Pressure limiting valve, the prime function of which is to serve as a safety device. It is usually preset and may be of two types : one which opens to atmosphere at positive and another at negative pressures. At elevated pressures, it releases gas to prevent over pressure

---

[1] By fluid is meant gas (or mixture), and/or vapours.

(BLOW-OFF VALVE) or at sub-atmospheric pressure, it opens to meet inspiratory flow requirements.

3.2.8 **adjustable pressure limiting valve (APL valve)** : Pressure limiting valve which releases gas over an adjustable range of pressures Its purpose is to allow for :

a) to control system pressure and thus intra-pulmonary pressure and,

b) to release excess anaesthetic gases and vapours.

The APL valve is also known as a "POP-OFF VALVE".

3.2.9 **pressure-regulating valve** Valve used in a system to lower the line pressure to a safe delivery pressure

For example a cylinder or pipeline to a flowmeter.

3.2.10 **non-rebreathing valve** Valve in ordinary usage which prevents the inspiration of any expired gas.

3 2.11 **flow-direction sensitive component** . Component through which the gas flow must be in one specific direction only for its proper functioning and/or patient safety

3.2.12 **flow-control valve** . Device which controls the rate of flow of a gas or a mixture of gases

3.2.13 **oxygen flush valve** . Manually operated valve for delivery of a relatively large flow of oxygen close to the common gas outlet without having passed through flowmeter and/or vaporizer

4 Airways and tracheal tubes

4.1 **anatomical airway** . The natural pathways through which respired gases pass in either direction between the atmosphere and the alveoli

4.2 **tracheal tube (endotracheal tube)** : Tube designed for insertion through the larynx into the trachea to convey gases and vapours to and from the trachea.

4.2.1 **oro-tracheal tube** . Tracheal tube for insertion through the mouth into the trachea.

4.2.2 **naso-tracheal tube** : Tracheal tube for insertion through the nose into the trachea.

4.3 **artificial airway** : Device intended to maintain the patency of the upper respiratory passages.

4.3.1 **oro-pharyngeal airway** : Device intended to maintain the patency of the respiratory passages through the oral cavity and pharynx

4.3.2 **naso-pharyngeal tube** . Tube designed for insertion through the nose into the pharynx.

4.4 **bronchial tube** Tube designed for insertion into one of the main bronchi

4.5 **bronchial blocker** · Device designed for introduction through the trachea to occlude a bronchus.

4.6 **tracheostomy (tracheotomy) tube** : Tube designed for insertion into the trachea through a tracheostomy (tracheotomy).

4.7 **patient end** That end of the tracheal tube which is intended to be inserted into the trachea.

4.8 **machine end** : That end of the tracheal tube which is intended to project from the patient

4.9 **bevel** Slanted portion at the patient end of the tracheal tube

4.9.1 **angle of bevel** : Angle between the plane of the bevel and the longitudinal axis of the tracheal tube at the patient end.

4.10 **cuff** Inflatable sleeve which may be present near the patient end of the tracheal tube to provide an effective fit between the tube and the trachea.

4.10.1 **bonded cuff** · Cuff permanently attached to the tracheal tube.

4.10.2 **slip-on cuff** : Cuff which is not permanently attached to the tracheal tube.

4.11 **inflating tube** : Tube through which the cuff is inflated.

4.12 **pilot balloon** : Balloon which may be fitted to the inflating tube to indicate inflation of the cuff.

4.13 **reinforced tube** : Tracheal tube the wall of which incorporates an additional material intended to avoid kinking.

The term "armoured tube" is to be deprecated.

4.14 **Murphy tube** : Tracheal tube with a round or oval hole in the wall opposite the bevel.

5 Breathing machines

NOTE — The symbol used for pressure in this clause is not in conformity with the prescriptions of ISO 31, which advocates *p* and not *P*.

5.1 General terms

5.1.1 ventilator : Device which is designed to augment or provide ventilation for the patient.

5.1.1.1 lung ventilator : Automatic device which is connected to the patient's airway and is designed to augment ventilation or provide ventilation for the patient.

5.1.1.2 external body ventilator : Machine designed to augment or replace the patient's ventilation by means of the application of intermittent or alternating pressures to the trunk.

5.1.2 resuscitator :Portable device used in emergency situations to provide lung ventilation to individuals whose breathing is inadequate.

5.1.3 continuous flow apparatus : Device delivering a continuous flow of anaesthetic gases or vapours at the ambient pressure, to meet the patient's respiratory requirements.

5.1.4 demand (intermittent-flow) apparatus : Device delivering a flow of gas, patient-triggered, during inspiration only at ambient pressure (or at respiratory pressure).

5.1.5 Types of external body ventilators

5.1.5.1 tank; cabinet : External body ventilator in which the patient is enclosed to his neck in a rigid airtight chamber.

5.1.5.2 cuirass : External body ventilator in which all or part of the trunk is in an airtight enclosure, forming or incorporating a rigid frame.

5.1.5.3 belt : External body ventilator consisting of a flexible airtight bag wrapped around a patient's trunk. When inflated, the bag produces forced expiration followed by inspiration upon deflation of the bag.

5.1.6 rocking apparatus : Device designed to produce or aid ventilation by using the weight of the abdominal contents to move the diaphragm.

5.1.7 electrostimulator (ventilatory) : Apparatus in which activity of the respiratory musculature is induced by electric impulses acting on the nerves or muscles.

5.1.8 inhalation therapy apparatus : Device which is connected to the patient's airway and is primarily desighed to deliver an aerosol and/or to augment the patient's ventilation.

5.2 Types of lung ventilators

5.2.1 controller : Apparatus which inflates the patient's lungs independently of the patient's inspiratory effort.

5.2.2 assistor : Device designed to augment the patient's inspiration synchronously with his inspiratory effort.

5.2.3 assistor-controller : Apparatus designed to function as either an assistor or a controller and which may, in default of the patient's inspiratory effort, automatically function as a controller.

5.3 Definitions relating to the performance of lung ventilators

5.3.1 frequency (ventilatory) (f) : Number of breathing cycles per minute.

5.3.2 tidal volume (V_T)[1] : Volume of gas, expressed in millilitres, entering or leaving the patient or the lung model during the inspiratory or expiratory phase time. The physical conditions under which gas volumes are measured should be given.

5.3.3 minute volume ($\overset{o}{V}$)[1] : Volume of gas, expressed in litres per minute entering or leaving the patient or lung model. The physical conditions under which measuring was made should be given.

5.3.4 volumetric displacement : That volume, under specific conditions and expressed in millilitres, passed per cycle during the inspiratory phase through the patient connection port when the pressure at the intake to the ventilator and the outlet from the patient's connection port is equal to the atmospheric pressure.

5.3.5 patient system : That part of the gas system of a ventilator through which respired gas travels at appropriate respiratory pressures.

5.3.6 apparatus internal compliance : Volume/pressure relationship[2] of those portions of the patient system which are pressurized during the inspiratory phase time (see 5.3.8, *airway pressure*).

5.3.7 ventilator pressure (P_{vent})[2] : Pressure at a specified point in the ventilator. The site and conditions under which measurements are made should be given.

---

[1] In clinical practice, the expiratory volume only is taken into consideration to avoid errors due to leakage.

[2] Pressure shall be expressed in terms of gauge pressure, in pascals (SI unit), millibars or centimetres of water (1 Pa = 10^{-2} mbar = 10^{-2} cmH_2O).

5.3.8 airway pressure (P_{aw})[1] : Pressure at a specified point in the patient's airway. The site and conditions under which measurements are made should be given.

5.3.9 alveolar pressure (P_{A})[1] : Pressure in the alveoli. In the case of the lung model, this is represented by the pressure in the compliance chamber.

5.3.10 sub-atmospheric pressure; sub-ambient pressure[1] : Pressure, lower than ambient, developed by the ventilator during the expiratory phase time.

5.3.11 maximum safety pressure ($P_{\mathrm{s\,max}}$)[1] : Highest gauge pressure which can be attained in the patient system during malfunction of the ventilator but with functioning safety mechanisms.

5.3.12 maximum working pressure ($P_{\mathrm{w\,max}}$)[1] : Highest gauge pressure which can be attained in the patient system during the inspiratory phase when the ventilator is functioning normally.

5.3.13 minimum safety pressure ($P_{\mathrm{s\,min}}$)[1] : Highest numerical value of sub-atmospheric gauge pressure which can be attained in the patient system during malfunction of the ventilator but with functioning safety mechanisms.

5.3.14 minimum working pressure ($P_{\mathrm{w\,min}}$)[1] : Highest numerical value of sub-atmospheric gauge pressure which can be attained in the patient system during the expiratory phase when the ventilator is functioning normally.

5.3.15 inspiratory triggering pressure (P_{tr})[1] : Airway pressure at the patient connection port which must be generated by the patient to initiate the ventilator inspiratory phase.

5.3.16 differential inspiratory triggering pressure (ΔP_{tr})[1] : Change in airway pressure at the patient connection port which must be generated by the patient to initiate the ventilator inspiratory phase.

5.3.17 inspiratory triggering flow ($\overset{o}{V}_{\mathrm{Tr}}$) : Flow which must be generated by the patient at the patient connection port to initiate the ventilator inspiratory phase.

5.3.18 inspiratory triggering volume (V_{tr}) : Volume, measured at the patient connection port, which must be moved by the patient to initiate the ventilator inspiratory phase.

5.3.19 inspiratory triggering response time (T_{tr}) : Time delay between the satisfaction of the inspiratory triggering pressure, and/or flow, volume requirements and the start of inspiratory flow.

5.3.20 inspiratory relief valve : Unidirectional valve designed to admit air to the patient system when the patient inspires spontaneously and the supply of inspiratory gases from the ventilator is inadequate.

5.3.21 inspiratory relief valve resistance : Pressure difference across the inspiratory relief valve at a constant flow of 30 l/min.

5.3.22 inspiratory phase time (T_{I}) : Interval from the start of inspiratory flow to the start of expiratory flow.

5.3.23 expiratory phase time (T_{E}) : Interval from the start of expiratory flow to the start of inspiratory flow.

5.3.24 inspiratory pause time (T_{IP}) : Interval from the end of inspiratory flow to the start of expiratory flow.

5.3.25 expiratory pause time (T_{EP}) : Interval from the end of expiratory flow to the start of inspiratory flow.

5.3.26 inspiratory-expiratory phase time ratio : Ratio of the inspiratory phase time to the expiratory phase time.

5.3.27 work (ventilator) : Work performed by the ventilator on the patient, expressed in joules.

$$W = \int (P_{\mathrm{aw}} \times \dot{V})\,\mathrm{d}t$$

5.3.28 power (ventilator) : Rate of work performed by the ventilator on the patient, expressed in watts.

$$\dot{W} = P_{\mathrm{aw}} \times \dot{V}$$

5.3.29 ventilator expiratory resistance : For ventilators in which expiration is not assisted, the total resistance to gas flow from the patient connection port through the expiratory port of the patient system to atmosphere. This is expressed in centimetres of water referred to a flow of 0,5 l/s.

NOTES

1 The suggested test flows are 1 l/s and 0,5 l/s for the adult model, 0,3 l/s for the paediatric model and 0,03 l/s for the neonatal model.

2 For further references, an International Standard is in preparation.

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[1] Pressure shall be expressed in terms of gauge pressure, in pascals (SI unit), millibars or centimetres of water (1 Pa ≈ 10^{2} mbar ≈ 10^{-2} cmH$_2$O).

5.3.30 sigh (ventilator) : Deliberate increase in tidal volume for one or more breaths at intervals.

5.3.31 time constant : Time in which an exponential process is 63 % complete.

5.4 Accessory equipment

5.4.1 spirometer : Device designed to measure a volume of gas.

5.4.2 nebulizing humidifier : Device designed to add water to the inspired gas in the form of droplets.

5.4.3 vaporizing humidifier : Device designed to add water to the inspired gas in the form of vapour.

5.4.4 gas venturi (Sanders) (endoscopy) : Device providing inflation of the lungs during endoscopic procedures by intermittent release of compressed gases by means of a jet within or towards the trachea.

5.4.5 flowmeter : Any device which indicates the volume of a specific gas passing through it in a unit of time.

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